



Heriot-Watt University Malaysia

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Research and New Knowledge;
Supporting the Four Pillars of Plumbing

World Plumbing Council Conference
Sept 2019

Four Pillars of Plumbing.....



Participation
(Training/Knowledge/Education)



Practices
(Standards/Accountability/Competency)

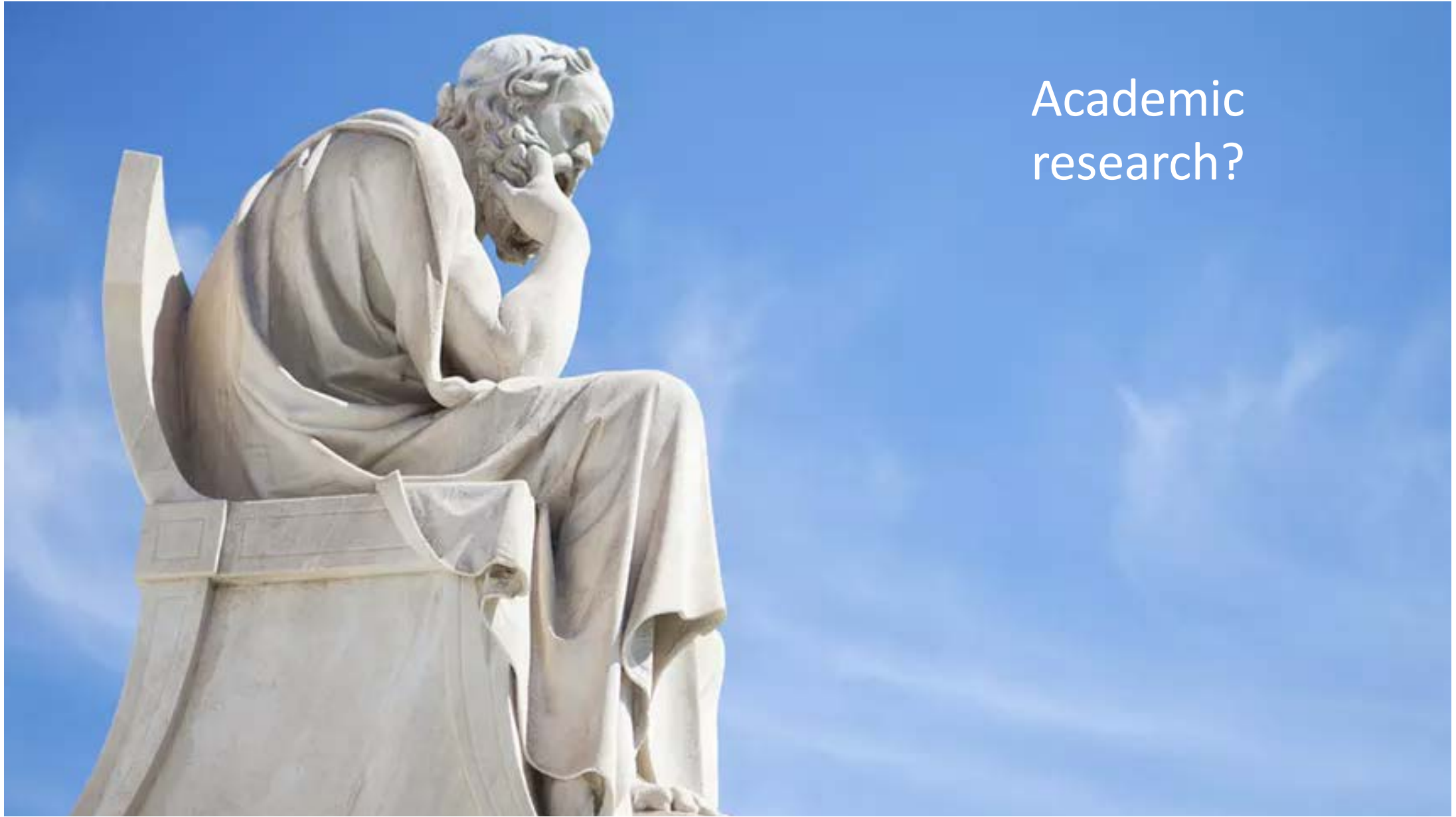


Products
(Materials/Fittings/Tools)



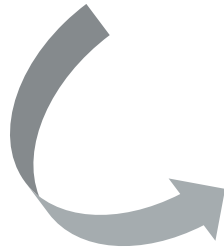
Protection
(Risk/Resilience)

Academic
research?





Innovate UK
Knowledge Transfer Network





Heriot-Watt University





Key Disciplines – Research and Teaching (M)



Core groupings (UG/PG)

- Engineering
- Construction
- Business
- Actuarial Science
- Psychology

PhD Degrees

- Engineering
- Statistics
- Social and Behavioural Science
- Business and Administration
- Architecture and Building (tbc)

Key Disciplines – Research and Teaching (M)



Core groupings

- Engineering (Public Health/Plumbing)
- Construction
- Business
- Actuarial Science
- Psychology

PhD Degrees

- Engineering
- Statistics
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- Internal building drainage – sanitary appliances
- Small scale local drainage and run off from the curtilage
- Roof drainage – conventional and siphonic
- Water supply – loading, conservation, reclamation

Numerical modelling.....

- Air pressure transient propagation
- Free-surface pipe flows
- Solid transport modelling
- Siphonic system priming/climate change
- Simultaneous water demand



CIB - Research

- ❑ Conseil du Batiment
 - ❑ International Council for Research and Innovation in Building and Construction
 - ❑ Established 1953
 - ❑ 30+ Working Groups
 - ❑ 13 Task Groups
-
- ❑ CIBW062 Water Supply and Drainage for Buildings
 - ❑ 38 Technical Presentations
 - ❑ 80 Delegates from 13 Countries
 - ❑ (Technical Visits/Social activities)





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Designing legionella-safe houses
W. Van Der Schee

Experimental and numerical study of aerosol generation rates for showerheads
Y. Zhou, K.W. Mui, L.T. Wong, P.H. Tsui, W.K. Chan

Difficulties encountered during the evaluation of a Legionella contamination level in a sanitary installation
K. Dianne, B. Bleys, O. Gerin

Investigation of electronic bidet usage in Chinese homes, and comparisons with Japanese usage
Kanako Toyosada, Li Xu, Mikoto Yamamoto

Reduce the risk of circulated hot water returning at a temperature which promotes pathogen growth
Robert Hardgrove

From refugee camp to city: Zaatari Primary School Project
Hana Nekrep and Matjaz Nekrep Perc

Quantification for food wastes of university canteens
L.T. Wong, K.W. Lai, K.W. Mui

Study of the concentration of DEHP plasticizer solving into water by UPVC supply pipes under thermal environment
M.C. Jeffrey Lee, Y. J. Yue, C.Y. Chen, Y.C. Lin

How much water does that building need??
David M Steblina

Assessing overestimation of water demand in different types of non-residential buildings in the UK
S. Mohammed, L.B. Jack, S. Patidar , and D.A. Kelly

Modelling design flow rates for cascade water supply systems in super high-rise residential buildings
Y. Zhou, Eric W.M. Lee, L.T. Wong, K.W. Mui

Performance metrics for cold water pipework sizing in the National Construction Code
A. Zeller and B. Ashe



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Examination of 'Net Zero Water Building' evaluation method in Japan

H. Kose, T. Nakano, T. Nishikawa

Water and energy facilities management system for hotel type buildings using IDEF0

A. Sewell, J. de Souza, L. Helena

Fact-finding investigation of toilet usage in high-rise office buildings and examination of drainage load calculation data

Yudai Motomura, Masayuki Otsuka, Shogo Sato, Sadahiro Koshiba

Green walls: water consumption & quantity and quality of drain water

J. Van Herreweghe, K. Dinne, O. Gerin and B. Bleys

Optimal operation model of rainwater reuse and detention mechanism for building raft foundation

C.L. Cheng, Hsin-Yu Chen and Yau-Chen Huang

Study of unit of design water supply amount and potential evaluation of rainwater utilization in middle-scale office building

A. Akasaka, T. Nishikawa

The application and efficiency of wall purification system in building

Yu-Fang Chen, Cheng-Li Cheng, Sadahico Kawamura

The hydrology and biodiversity characteristics of an experimental raingarden at RBGE in Scotland

D. A. Kelly, D. Knott, K. Wilson and A. Kalaichelvan

Drainage capacity of cork boards applied as base layers on living walls

C Pimentel-Rodrigues, N. Simoes, A. Tadeu and A. Silva-Afonso

The performance assessment of heat pump integrated with chilled water wall in different controlled parameters

M.C. Jeffrey Lee, Y.M. Fang, Christoph Mitterer, Hartwig, M. Kunzel

The Development of ISO Standard PC 31600 - Water Efficient Products

Steve Cummings and Peter DeMarco

Future Symposia

2020

Taichung, Taiwan

(Special session)



2021

Leuven, Belgium





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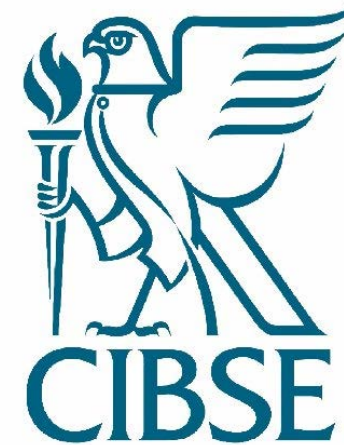


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Chartered Institution Building Services Engineers



Professional Body

21,000 members (international)

Licensed by UK Engineering Council

Registered Charity

‘Knowledge and Education in support
of Improved Building Performance
for the benefit of Society’

Advance education and research in
building Services Engineering





CIBSE Divisions

Society of Light and Lighting

Society Façade Engineers

Society Digital Engineering

Institute Local Exhaust Ventilation Engineers

Society of Public Health Engineers





CIBSE Divisions

Society of Light and Lighting

Society Façade Engineers

Society Digital Engineering

Institute Local Exhaust Ventilation Engineers

Society of Public Health Engineers

Approx 1250 members

68 Industrial Members

5 UK regions, 1 UAE, 1 (pending) Qatar

Treasurer – based in Sydney





Participation Pillar

Public Health Engineering - skills gap

Led to the launch of the SoPHE/CIPHE
Plumbing Centre of Excellence at Havering
College

Offers tailored CPD courses – legionella risk,
High-Rise drainage Venting, Water Demand
Estimation, Rainwater Design

Plans to roll out (additional colleges nation-
wide)

SoPHE offers student bursaries to registrants



Challenges

Increased cases of elevated water temps in buildings exacerbated by enhanced airtightness and infrequent building use

Demand loading calculation, oversizing of pumps and pipes, energy consumption

Climate change and storm water attenuation

Technological change, modelling, smart technologies

Fire safety/suppression systems



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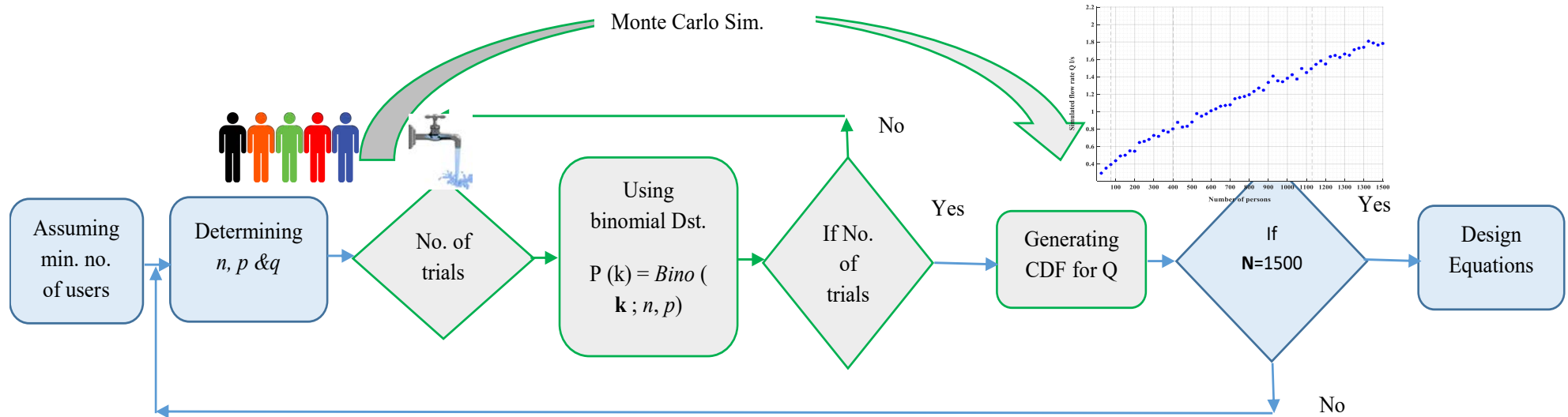
Developing an algorithm to estimate design flow for water services in medium-large scale residential installations

KTP Partnership ID
1024610



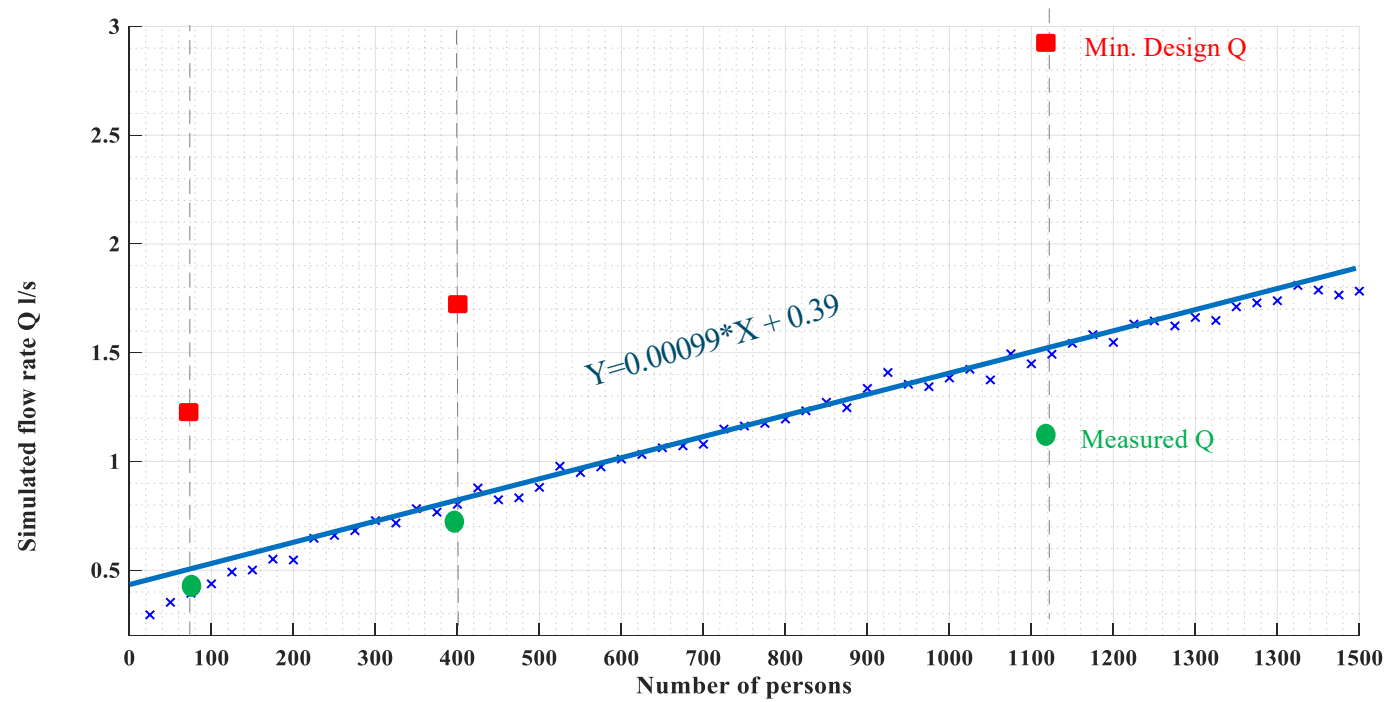
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New design method



Schematic illustration of the methodology of WDEM

Results



Academic
research?



Thank you

